

**AMENDMENTS TO THE DRAWINGS**

In response to the drawing objection, a replacement drawing sheet (Figure 2) is submitted herewith to show a contact metal layer 11, a positive-electrode-metal-containing layer 6, and a semiconductor-metal-containing layer 7.

Due to addition of the replacement drawing sheet of Figure 2, replacement sheets for Figures 1 and 3-7 are necessary and submitted herewith solely for the purpose of labeling the drawings with correct pagination (i.e., changing the drawing sheet pagination from “1/6-6/6” to “1/7-7/7”).

Attachments: Six (6) Annotated Sheets (Figs. 1-7)  
Seven (7) Replacement Drawing Sheet (Figs. 1-7)

### **REMARKS**

Upon entry of the Amendment, claims 1-7 and 9-16 will be all the claims pending in the application. Claims 1 and 9-11 have been amended. Claim 8 has been canceled. Claim 16 is withdrawn from consideration as being directed to a non-elected invention.

Claim 1 has been amended to more clearly point out the claimed subject matter. Particularly, claim 1 has been amended to recite a gallium nitride compound semiconductor light-emitting device comprising a substrate, an n-type semiconductor layer provided atop the substrate, a light-emitting layer provided atop the n-type semiconductor layer, a p-type semiconductor layer provided atop the light-emitting layer, a negative electrode provided in contact with the n-type semiconductor layer, and a positive electrode provided in contact with the p-type semiconductor layer, the n-type semiconductor layer, the light-emitting layer and the p-type semiconductor layer being composed of a gallium nitride compound semiconductor. Claim 1 has been further amended to incorporate therein the recitation of claim 8.

Claims 9-11 have been amended to depend from claim 1.

No new matter has been added. Entry of the Amendment is respectfully requested.

#### **I. Drawing Objection**

The Examiner objected to the drawings to under 37 C.F.R. § 1.83(a) as not showing the contact metal layer and a positive-electrode-metal-containing layer as described in the specification.

In response to the drawing objection, a replacement drawing sheet (Figure 2) is submitted herewith to show a contact metal layer and a positive-electrode-metal-containing layer including identifying reference numbers. Figure 2 also shows a semiconductor-metal-containing layer, which is described in the original claim 8.

Due to addition of the replacement drawing sheet of Figure 2, replacement sheets for Figures 1 and 3-7 are necessary and submitted herewith solely for the purpose of labeling the drawings with correct pagination (i.e., changing the drawing sheet pagination from “1/6-6/6” to “1/7-7/7”).

No new matter has been added.

Withdrawal of the drawing objection and acceptance of the new drawing sheet are respectfully requested.

## **II. Claim Rejection under 35 U.S.C. §112**

Claims 1-16 were rejected under 35 U.S.C. §112, second paragraph, as allegedly being indefinite. The Examiner asserted that it is unclear what the preamble of claim 1 is, and that the recited limitation of "the layers being successively provided atop the substrate in this order" is unclear as to which layers and which order Applicants are referring to.

In the accompanying amendments, claim 1 has been amended to recite a gallium nitride compound semiconductor light-emitting device comprising a substrate, an n-type semiconductor layer provided atop the substrate, a light-emitting layer provided atop the n-type semiconductor layer, a p-type semiconductor layer provided atop the light-emitting layer, a negative electrode provided in contact with the n-type semiconductor layer, and a positive electrode provided in contact with the p-type semiconductor layer, the n-type semiconductor layer, the light-emitting layer and the p-type semiconductor layer being composed of a gallium nitride compound semiconductor.

Applicants respectfully submit that the amendments to claim 1 render the rejection under 35 U.S.C. § 112, second paragraph moot and request the rejection be withdrawn.

### **III. Claim Rejections under 35 U.S.C. § 102/§103 Over Onomura**

Claims 1-2, 4, 5, 8-9, 12 and 14-15 were rejected under 35 U.S.C. §102(b) as being anticipated by Onomura et al (US 6,067,309).

Claims 3, 5, 7, 10-11 and 13 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Onomura.

Applicants respectfully traverse the above rejections.

The Examiner contends that Fig. 1 of Onomura discloses a gallium nitride compound semiconductor light-emitting device including a substrate (1), an n-type semiconductor layer (3+4), a light-emitting layer (6), a p-type semiconductor layer (7+8), a negative electrode (14) provided in contact with the n-type semiconductor layer (3+4), and a positive electrode (10+11a+11+12+13) provided in contact with the p-type semiconductor layer (7+8), the layers being successively provided atop the substrate in this order and being composed of a gallium nitride compound semiconductor (Fig. 1), wherein the positive electrode (10+11a+11+12+13) includes at least a contact metal layer (10) which is in contact with the p-type semiconductor layer (7+8); the contact metal layer (10) comprises at least one metal selected from the group consisting of Pt; and the surface portion of the p-type semiconductor layer (7+8) on the positive electrode side includes a positive-electrode-metal-containing layer (15) that contains at least one metal selected from the group consisting of Pt.

However, Onomura at least fails to disclose or suggest that the surface portion of the contact metal layer on the p-type semiconductor layer side includes a semiconductor-metal-containing layer that contains a Group III metal, as recited in amended claim 1.

Onomura also does not render obvious the presently claimed invention for the following reasons.

In the present invention, the semiconductor-metal-containing layer is a layer which is present in the contact metal layer and which contains a metal forming the semiconductor (see page 11, lines 26 to 30, of the present specification).

The Examiner asserts on page 5 of the Office Action that Onomura discloses a semiconductor-metal-containing layer (9). However, the layer (9) in Onomura is a p-type contact layer (see column 5, lines 48 to 59, of Onomura) and corresponds to the contact layer 5a of the present invention (see page 8, lines 21 to 30, of the present specification). Therefore, Onomura does not disclose or suggest a semiconductor-metal-containing layer, as required by present claim 1.

Further, in the present invention, the semiconductor-metal-containing layer and the positive-electrode-metal-containing layer may be formed by forming the contact metal layer through RF discharge sputtering and may be not formed in case of forming the contact metal layer through DC discharge sputtering (see Example 1, comparative Example and page 13, line 10 to page 14, line 4 of the present specification).

On the other hand, in Onomura, there is no description or suggestion regarding the formation method of a Pt layer 10 corresponding to the contact metal layer of the present invention. Onomura discloses that Pt is diffused to the p-type contact layer 9 by a thermal treatment at 350°C after forming the Pt layer 10. As a result, an alloy layer 15 of Pt-semiconductor, which corresponds to the positive-electrode-metal-containing layer of the present invention, is formed in the p-type contact layer 9 (see Fig. 1 and column 6, lines 34 to 42, of Onomura). Also, at the same time N is diffused from the p-type contact layer 9 to the Ti

layer 11 on the Pt layer 10 and as a result the Ti layer 11a containing TiN is formed. However, Onomura does not disclose that Ga is diffused from the p-type contact layer 9 to the Pt layer 10 and as a result a layer containing Ga, i.e., a metal forming the semiconductor, is formed in the Pt layer 10.

Therefore, for these additional reasons, Onomura does not disclose or suggest the semiconductor-metal-containing layer as required by amended claim 1.

Accordingly, Applicants respectfully submit that the present claims are patentable over Onomura, and withdrawal of the foregoing rejections under 35 U.S.C. § 102 and §103 is respectfully requested.

#### **IV. Conclusion**

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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**23373**

CUSTOMER NUMBER

Date: March 11, 2009

~~1/6~~ 1/7

Fig.1

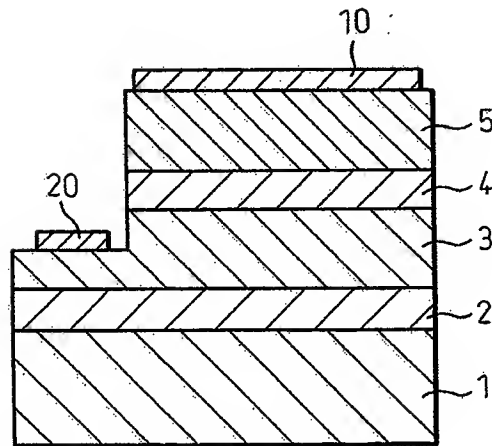
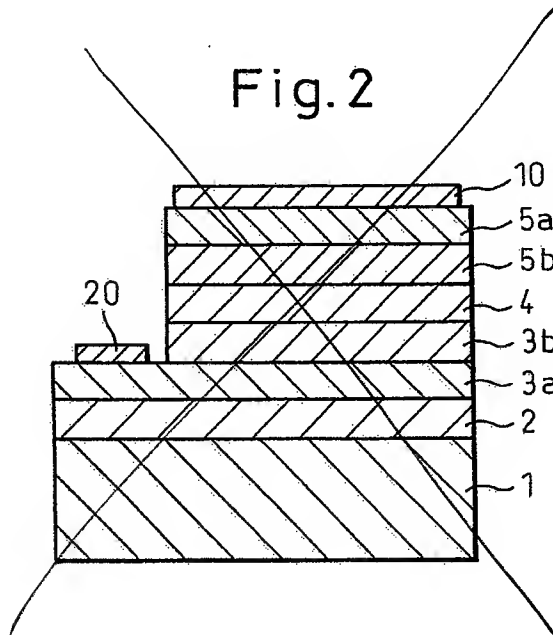
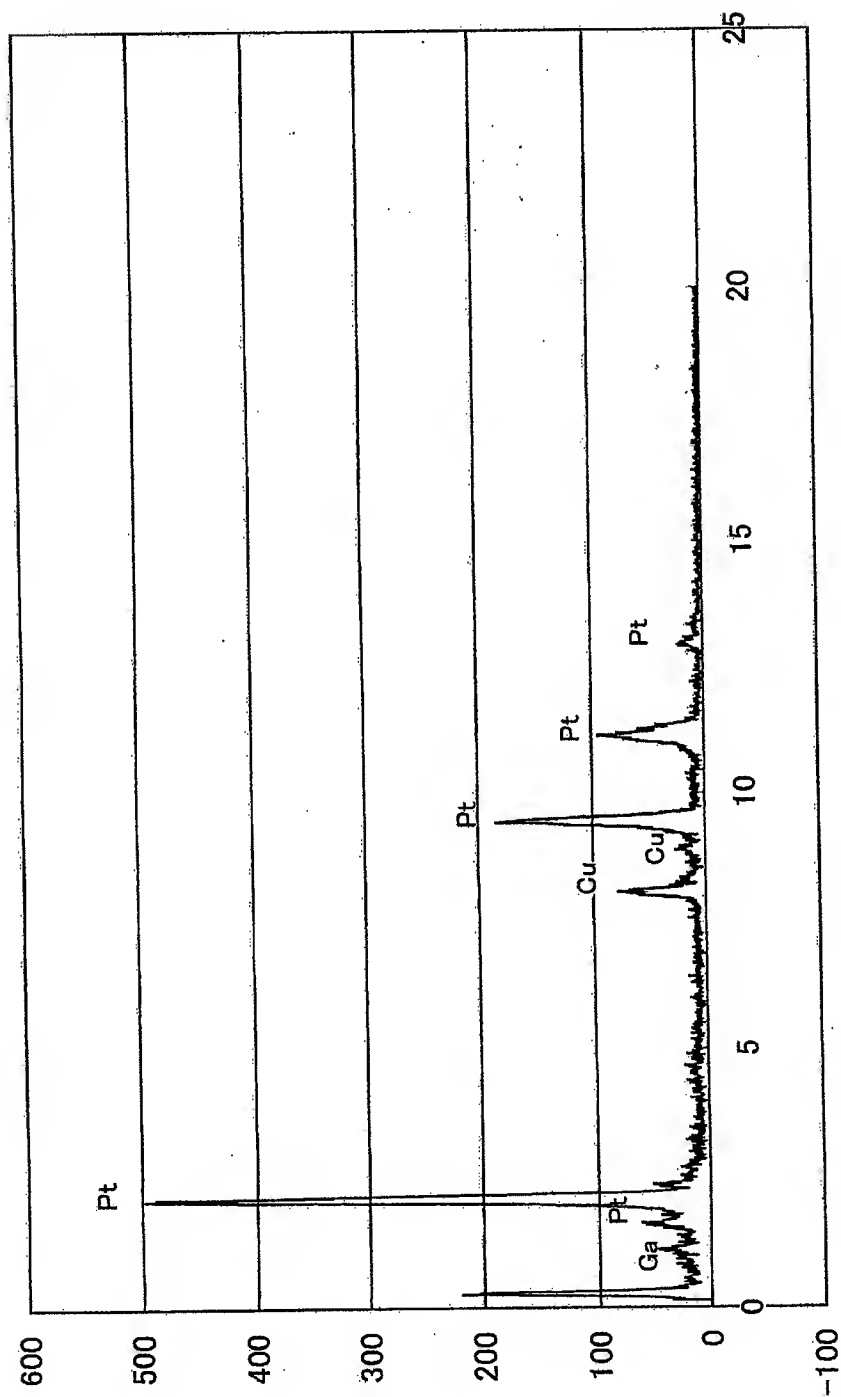


Fig.2



~~2/6~~ 3/7

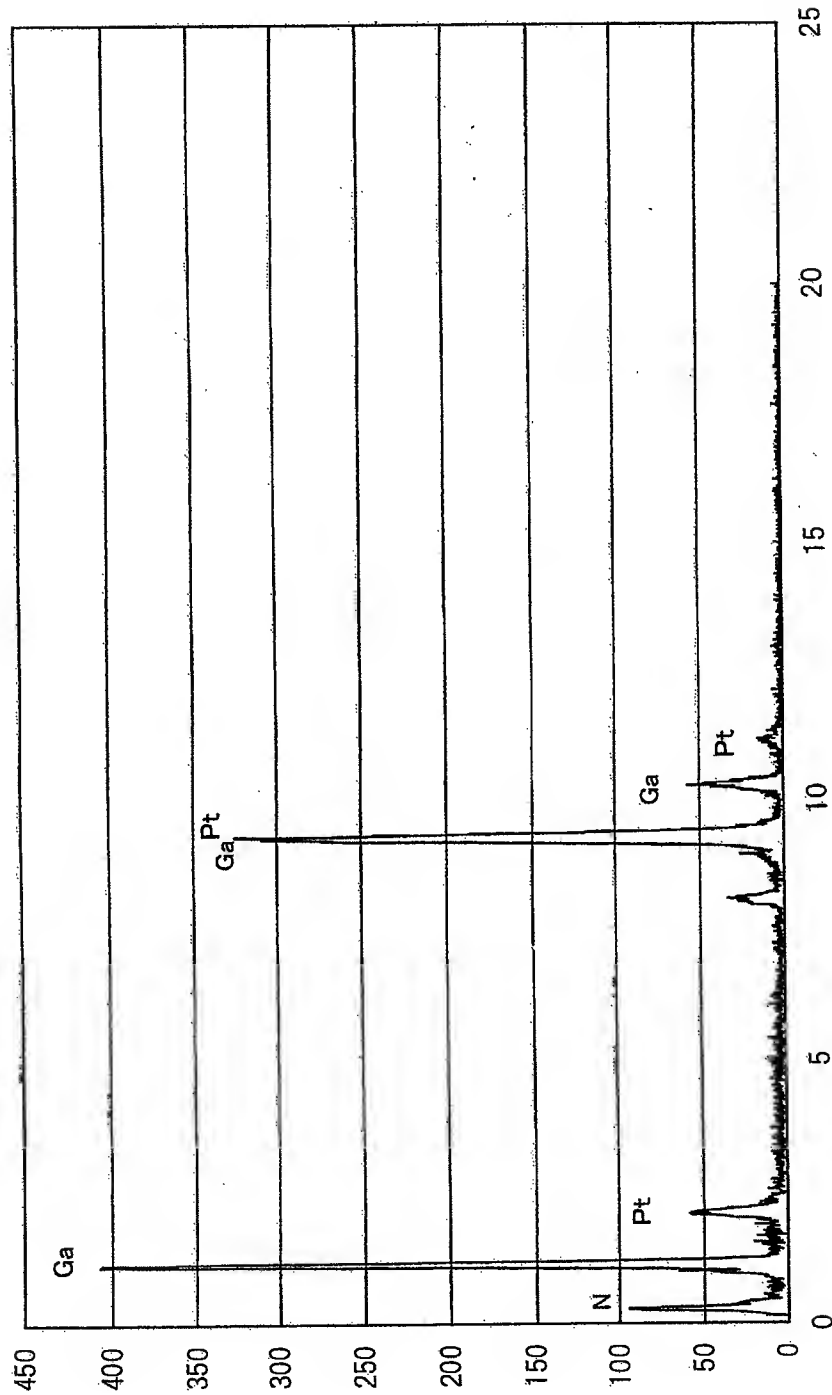
Fig. 3





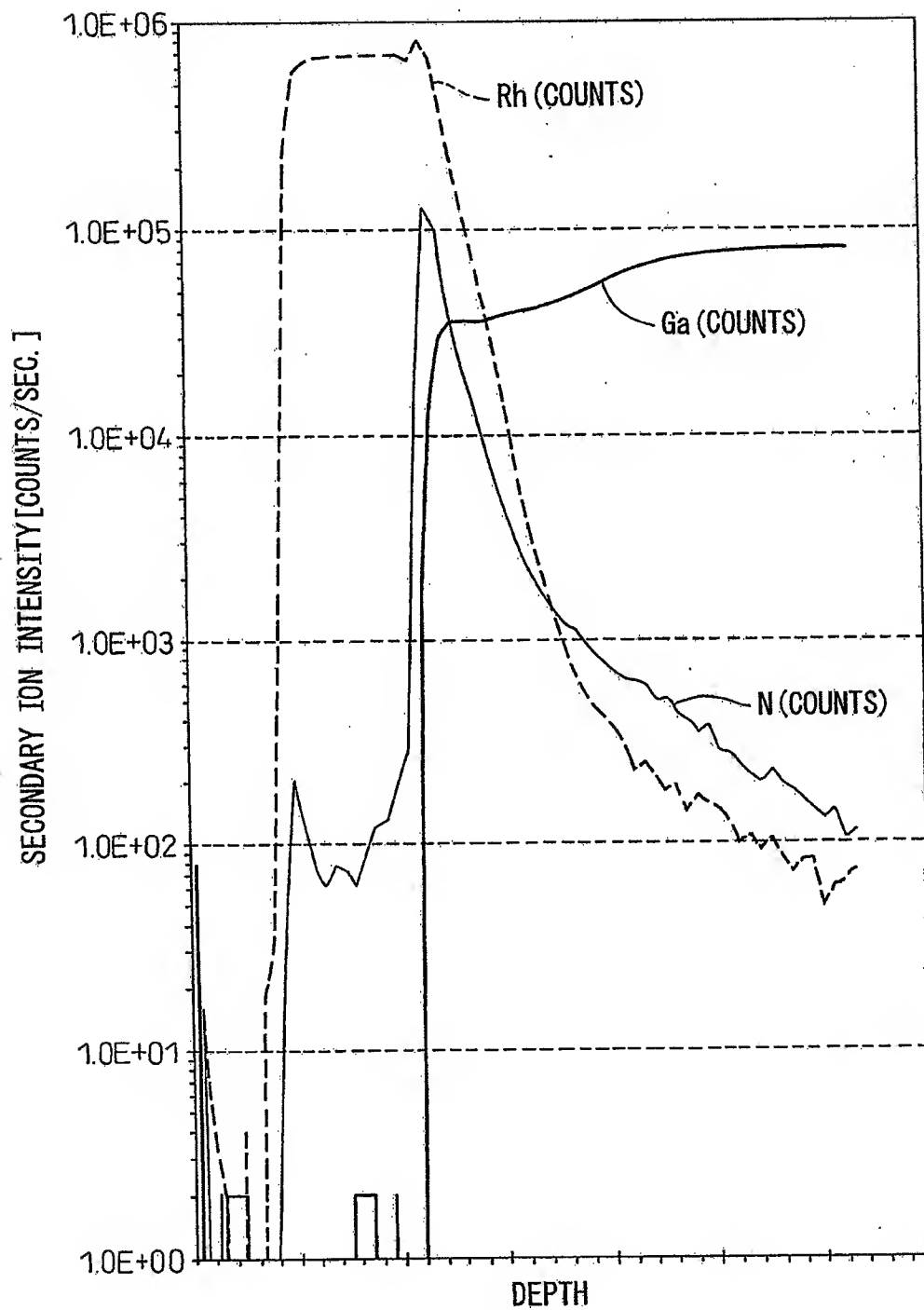
~~3/6~~ 4/7

Fig. 4



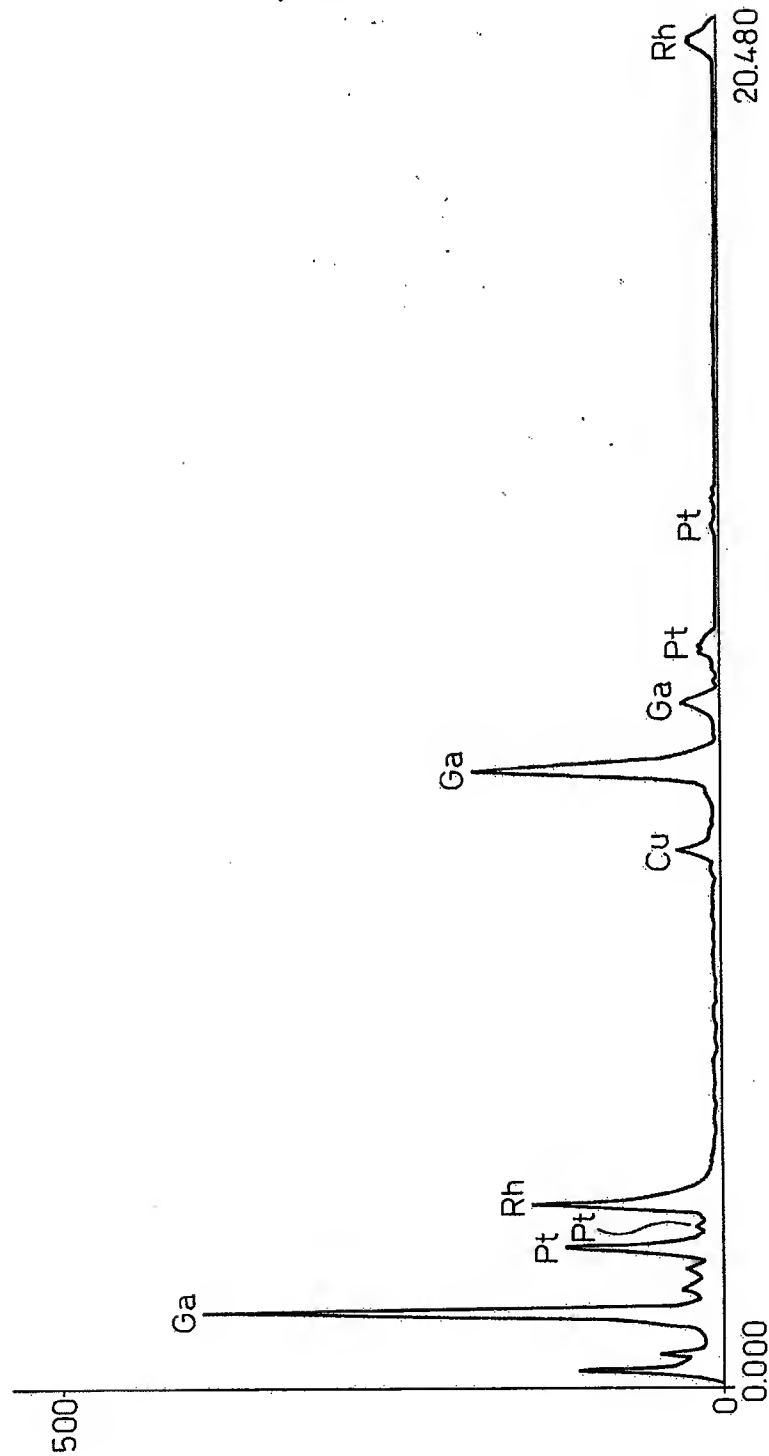
~~4/6~~ 5/7

Fig. 5



~~5/6~~ 6/7.

Fig. 6



~~6~~ 7/7

Fig. 7



GaN

